

## Summary Points

- Firearm injuries are a growing public health problem in Virginia. These can include all types of firearm injuries, including self-harm, assault, unintentional (did not happen on purpose), legal intervention or war, or undetermined.
- From 2016 to 2021, there were 12,747 firearm injury emergency department (ED) visits in Virginia. Firearm injury ED visits increased 72% from 2018 to 2021.
- There were 4,256 nonfatal firearm injury hospitalizations among Virginians from 2016 to 2021.
- In 2021, Virginians were hospitalized for nonfatal firearm injuries for a total of 6,772 days, with almost \$134 million dollars in hospitalization costs.
- On average, three Virginians died by firearm every day from 2016 to 2021.
- A total of 6,532 Virginians died by firearm from 2016 to 2021, resulting in an average of 1,088 deaths each year. Firearm-related deaths increased 21% from 2019 to 2021.
- Most deaths by firearm in 2016 to 2021 were suicide (62%), followed by homicide (35%).
- Firearm-related homicide deaths increased 47% from 2019 to 2021 (342 to 502 deaths); firearm-related suicide deaths increased 7% during the same period (662 to 707 deaths).
- Males and people aged 15-24 years experienced the highest burden of firearm injury across ED visits, nonfatal hospitalizations, and deaths from 2016 to 2021.

## Introduction

In the United States (U.S.), over 45,000 people died by firearm in 2020, and almost twice that experienced nonfatal firearm injuries.<sup>1</sup> These include firearm injuries and deaths that were intentionally self-inflicted, assault-related, unintentional, those resulting from law enforcement encounters, and those where the intent is undetermined. Firearm injuries impact the well-being of individuals, families, friends, neighborhoods, and communities.

There are a range of factors that can make people at higher risk for a firearm injury. Individual level risk factors can include substance use,<sup>2-4</sup> mental health challenges,<sup>5,6</sup> or easy access to a firearm.<sup>7,8</sup> Relationship factors can also play a role, like experiencing bullying<sup>9</sup> or being in a high-conflict or violent relationship.<sup>10,11</sup> Societal level factors, like living in an area with high income inequality, more unemployment, or higher poverty, can also increase risk of firearm injury.<sup>12-14</sup> These economic conditions are due in part to long-standing systemic inequities that limit economic or educational opportunities.<sup>15,16</sup> Further, the Coronavirus Disease 2019 (COVID-19) pandemic had wide-ranging impacts on physical and mental health and may have contributed to an increase in firearm injury.<sup>17-19</sup> There are ways to address risk factors related to firearm injury. Some examples are: teaching and learning conflict resolution, healthy relationships, or problem-solving skills<sup>20</sup>; making and maintaining connections with friends, family, and neighbors<sup>21,22</sup>; having access to physical and behavioral healthcare<sup>23,24</sup>; practicing safe firearm storage<sup>25-27</sup>; creating green spaces in neighborhoods<sup>28,29</sup>; and developing policies that address economic inequities.<sup>30,31</sup> **Firearm injuries are a public health issue, and they are *preventable*.**<sup>32</sup>

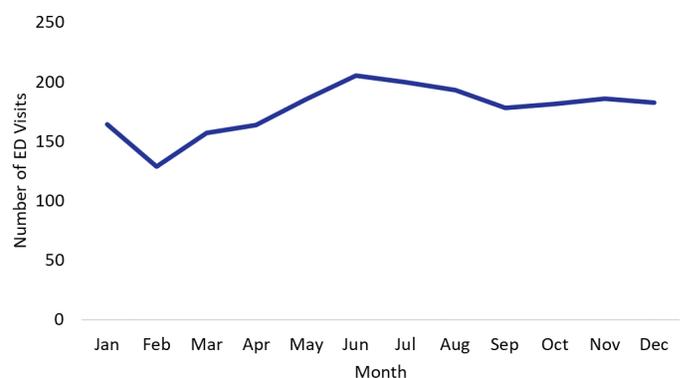
## Methods

The Virginia Department of Health (VDH) examined firearm injury emergency department (ED) visits, nonfatal (not deceased at discharge) firearm injury hospitalizations, and firearm-related deaths from 2016 to 2021. This is a descriptive epidemiological analysis of firearm injuries in Virginia based on available VDH data sources. This data brief is not a research study. Virginia population estimates come from the Centers for Disease Control and Prevention (CDC) National Center for Health Statistics. Maps for ED visits, nonfatal hospitalizations, and deaths use a color gradient to show rates per 10,000 ED visits (ED visits) and rates per 100,000 population (nonfatal hospitalizations and deaths). Lighter yellow means lower rates, and darkest blue means highest rates. Using rates allows for comparison among different geographic areas. Percentages were rounded to the nearest whole number. Rates were rounded to one decimal place. More details about data sources, methods, and limitations are included on page 10.

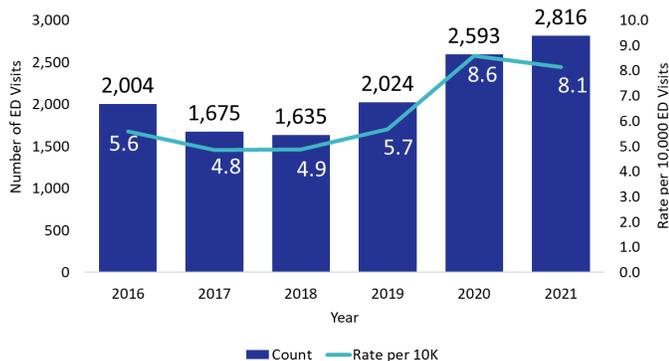
## Emergency Department (ED) Visits

During 2016-2021, there were 12,747 firearm injury ED visits in Virginia, an average of 2,125 visits each year. Firearm injury ED visits decreased 18% from 2016 to 2018, then increased 72% between 2018 and 2021 (Figure 1). From 2016-2019, there were an average of 1,835 firearm injury ED visits each year. In contrast, during the COVID-19 pandemic in 2020-2021, there were an average of 2,705 firearm injury-related ED visits annually.

**Figure 2. Average monthly firearm injury ED visits, Virginia, 2016-2021**



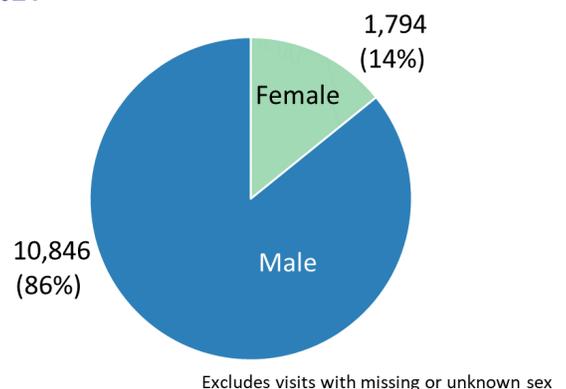
**Figure 1. Firearm injury ED Visits in Virginia, 2016-2021**



On average during 2016-2021, there were 17% more firearm injury ED visits per month in the summer months of June - August compared to the rest of the year (September - May) (Figure 2).

The burden of firearm injuries varies by sex, age, and race/ethnicity. Of all firearm injury ED visits during 2016 -2021, most (86%) occurred among males (Figure 3).

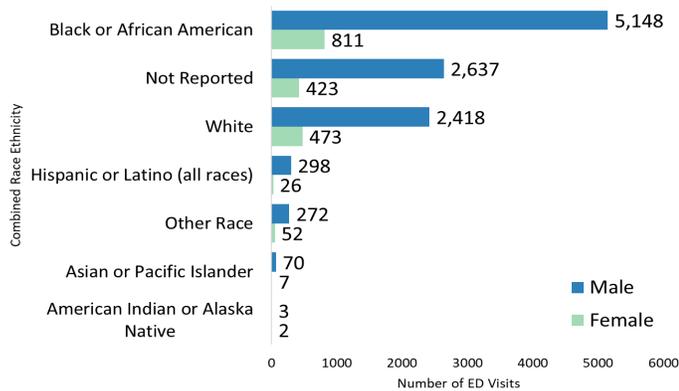
**Figure 3. Firearm injury ED visits by sex, Virginia, 2016-2021**



**ED Visits (continued)**

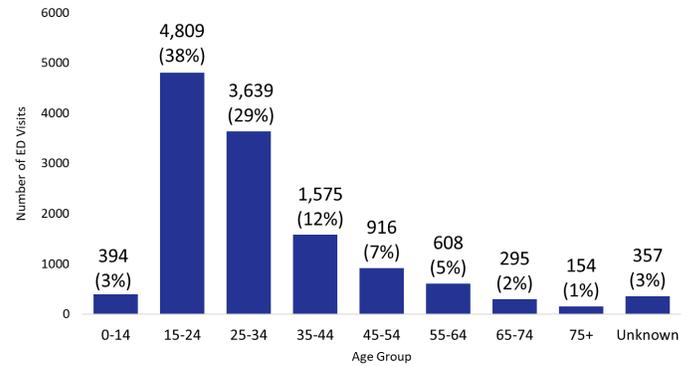
Black males experienced the highest number of firearm injury ED visits during 2016-2021 followed by White males (Figure 4). For each racial/ethnic group, females experienced fewer firearm injury ED visits than males. Among females, the most visits were Black or African American (811), and the fewest were Asian or Pacific Islander (7) and American Indian or Alaska Native (2).

**Figure 4. Firearm injury ED visits by race/ethnicity and sex, Virginia, 2016-2021**



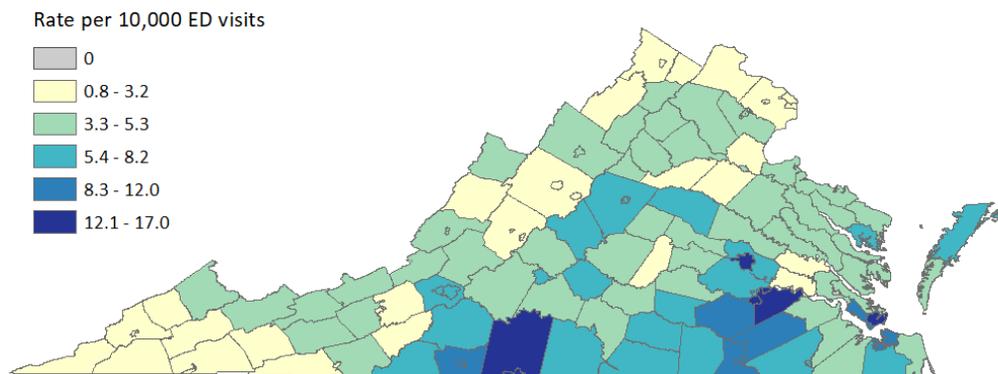
During 2016-2021, 38% of all firearm injury ED visits occurred among 15-24 year olds (Figure 5).

**Figure 5. Firearm injury ED visits by age group, Virginia, 2016-2021**



A total of 394 (3%) firearm injury ED visits occurred among children under 15 years of age. Firearm injury ED visit rates also varied across Virginia cities and counties (Figure 6). Rates are the number of firearm injury ED visits per 10,000 ED visits. Using rates allows comparison among different geographic areas. The state rate per 10,000 ED visits for 2016-2021 was 6.2 per 10,000 ED visits. Prince George, Hopewell and Petersburg (combined\*) had the highest rate of firearm injury ED visits (16.7 per 10,000 ED visits) for 2016-2021, followed by Richmond City (16.2), Hampton (13.0), Pittsylvania County and Danville combined\* (13.0), Portsmouth (11.4) and Newport News (11.1). The lowest rates were Williamsburg City (0.0), Arlington County (0.8), Washington County and Bristol City combined\* (1.2), and the counties of Loudoun (1.5), Dickenson (1.8), and Bath (1.8).

**Figure 6. Firearm injury ED visit rates among Virginia residents by locality\*, 2016-2021**

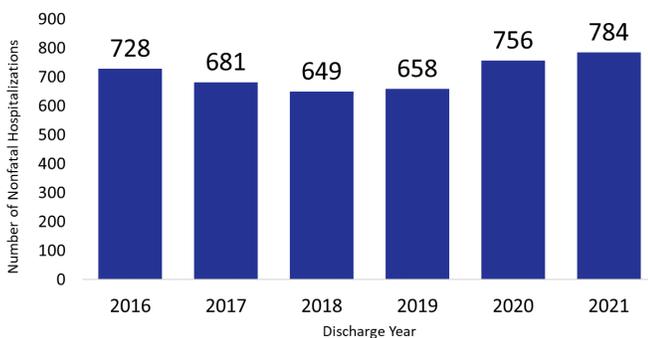


\* Some cities and counties are combined due to zip codes spanning multiple localities. ED visits by out-of-state residents were not mapped.

## Nonfatal Inpatient Hospitalizations

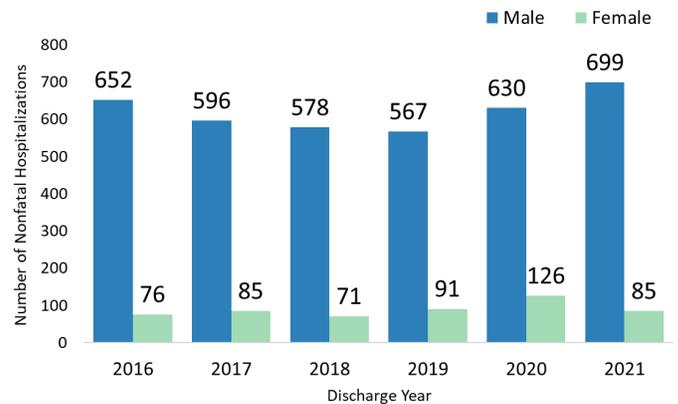
There were 4,256 nonfatal firearm injury hospitalizations among Virginians in the six-year period of 2016-2021, an average of 709 each year (Figure 7). Nonfatal firearm injury hospitalizations decreased 11% from 2016 to 2018 (728 in 2016 to 649 in 2018), remained stable from 2018 to 2019, and increased 19% from 2019 to 2021 (658 in 2019 to 784 in 2021). Eight percent of nonfatal firearm injury hospitalizations in 2016-2021 also had a traumatic brain injury (TBI).

**Figure 7. Nonfatal firearm injury hospitalizations among Virginia residents, 2016-2021**



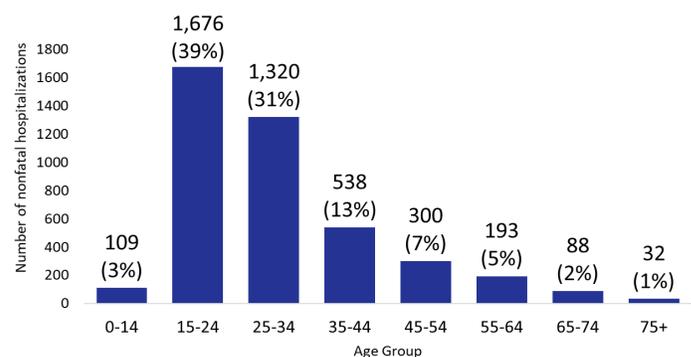
Almost nine out of 10 (87%) nonfatal firearm injury hospitalizations each year were among males. Hospitalizations among males were lowest in 2019 (567) but increased 23% from 2019 to 2021. Nonfatal firearm injury hospitalizations among females increased 66% from 2016 to 2020 (76 in 2016 to 126 in 2020), then declined in 2021 (85) (Figure 8). Over six out of 10 (69%) nonfatal firearm injury hospitalizations in 2016-2021 were non-Hispanic Black, followed by 22% non-Hispanic White.

**Figure 8. Nonfatal firearm injury hospitalizations by sex among Virginia residents, 2016-2021**



Seventy-three percent of nonfatal firearm injury hospitalizations in 2016-2021 were Virginians under the age of 35 years (Figure 9). The age group with the highest percentage of nonfatal firearm injury hospitalizations were those aged 15-24 years (39%), followed by 25-34 year olds at 31%. During 2016-2021, Virginia youth and young adults aged 15-24 years who were hospitalized for a nonfatal firearm injury increased 11% from 2016 to 2021 (297 in 2016 to 329 in 2021).

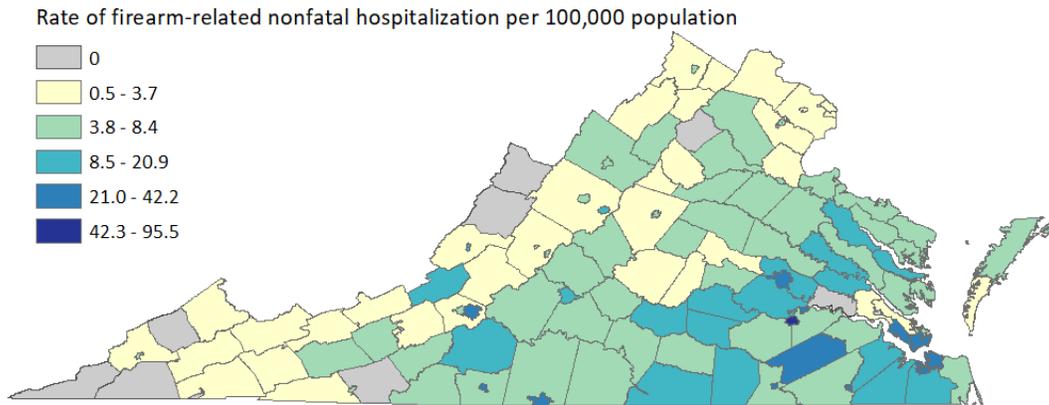
**Figure 9. Nonfatal firearm injury hospitalizations by age group among Virginia residents, 2016-2021**



### Nonfatal Inpatient Hospitalizations (continued)

Figure 10 shows the combined rates of nonfatal firearm injury hospitalization per 100,000 population by locality for 2016-2021. The state nonfatal firearm injury hospitalization rate for 2016-2021 was 8.3 per 100,000 Virginia residents. Petersburg City had the highest combined rate of nonfatal firearm injury hospitalization in 2016-2021 (95.5), followed by the cities of Hopewell (42.2), Richmond (42.1), Portsmouth (40.9), and Martinsville (35.2) (Figure 10). There were twelve localities that had a combined rate of zero in 2016-2021.

**Figure 10. Nonfatal firearm injury hospitalization rates per 100,000 Virginia residents by locality, 2016-2021**

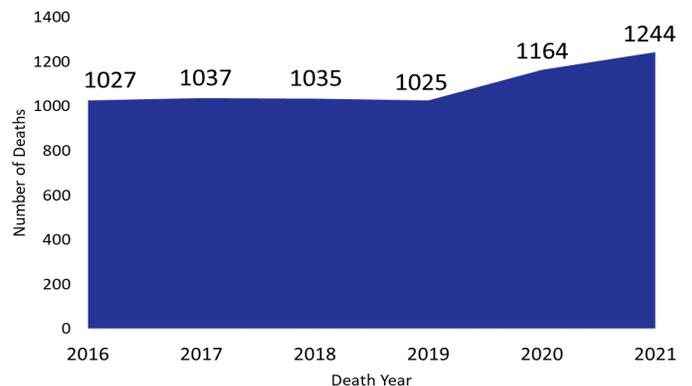


Further, there were economic impacts related to firearm injury in Virginia. In 2021, the average length of stay for a nonfatal firearm injury hospitalization was almost nine days. The average cost was over \$170,000 per hospitalization. Virginians of all ages were hospitalized for nonfatal firearm injuries for a total of 6,772 days with almost \$134 million dollars in hospitalization costs in 2021.

### Deaths

There were 6,532 firearm-related deaths in Virginia during 2016-2021, an average of 1,089 deaths each year. In 2021 alone, firearm-related deaths resulted in 42,845 years of potential life lost. Firearm-related deaths were stable from 2016 to 2019, but increased 21% from 2019 to 2021 (Figure 11).

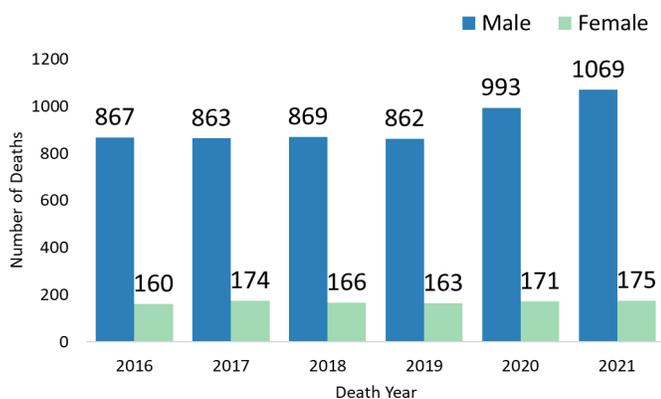
**Figure 11. Firearm-related deaths among Virginia residents, 2016-2021**



## Deaths (continued)

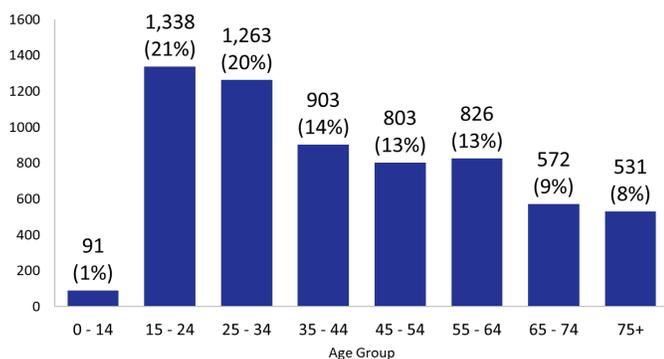
During 2016-2021, over eight out of 10 (85%) firearm-related deaths were male. Deaths among females remained relatively stable from 2016 to 2021; however, deaths among males increased 23% during the same period (867 in 2016 to a peak of 1,069 in 2021; Figure 12).

**Figure 12. Firearm-related deaths by sex among Virginia residents, 2016-2021**



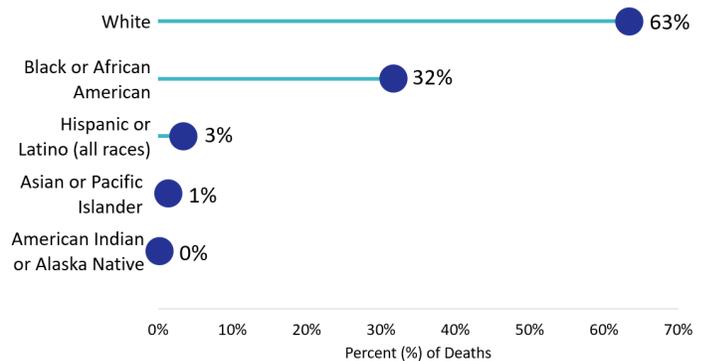
During 2016-2021, over four out of 10 (42%) firearm-related deaths were Virginians under 35 years old, with the 15-24 year age group representing the highest percentage of deaths by firearm during this time period (21%; Figure 13).

**Figure 13. Firearm-related deaths by age group among Virginia residents, 2016-2021**



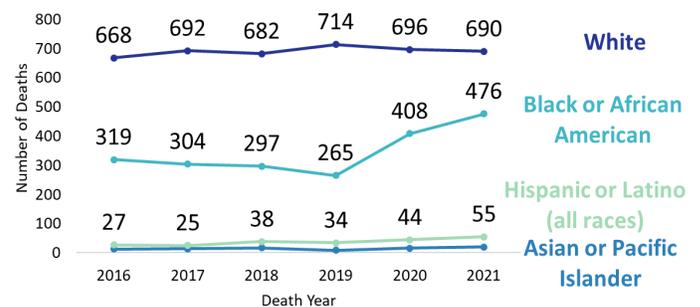
In 2016-2021, 63% of firearm-related deaths were White Virginians, followed by Black or African American Virginians at 32% (Figure 14). Hispanic or Latino and Asian or Pacific Islander Virginians made up 3% and 1% of firearm-related deaths, respectively. American Indian or Alaska Native Virginians represented 0.2% of the firearm-related deaths, which rounded to the nearest whole number, is 0%.

**Figure 14. Percent of firearm-related deaths by race/ethnicity among Virginia residents, 2016-2021**



However, there are different trends in firearm-related deaths by race/ethnicity across the six-year time period (Figure 15).

**Figure 15. Firearm-related deaths by race/ethnicity and death year among Virginia residents, 2016-2021**



## Deaths (continued)

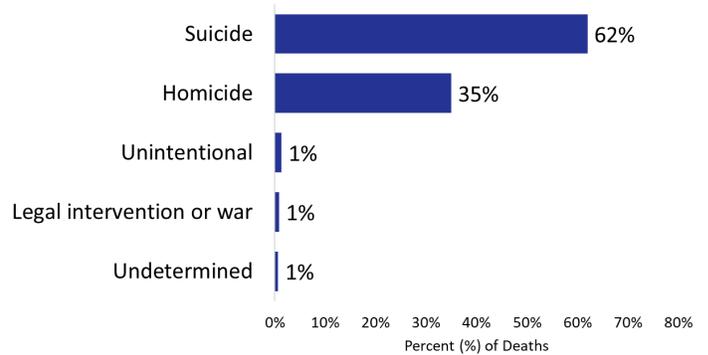
Even though a majority of firearm-related deaths in 2016-2021 were White, death counts remained stable over the six-year time period, ranging from 666-714 deaths each year; the highest number of deaths for White Virginians was in 2019 (714). During the 2016-2021 time period, firearm-related deaths among Asian or Pacific Islander (20) and Hispanic or Latino Virginians (55) were highest in 2021. Firearm-related deaths among Black or African American Virginians were also stable from 2016 to 2019; however, from 2019 to 2021, firearm-related deaths increased 80% (265 in 2019 to 476 in 2021). Further analysis is needed to determine the cause of the increase, but recent research suggests that disproportionate health and economic impacts of the COVID-19 pandemic among Black and African American communities may be a contributing factor.<sup>32</sup> There were 11 firearm-related deaths among American Indian or Alaska Native Virginians during 2016-2021 (omitted from Figure 15 due to low counts).

Firearm-related death rates from 2016 to 2021 varied across Virginia cities and counties (Figure 16). The state combined rate of firearm-related death during 2016-2021 was 12.8 per 100,000 Virginia residents.

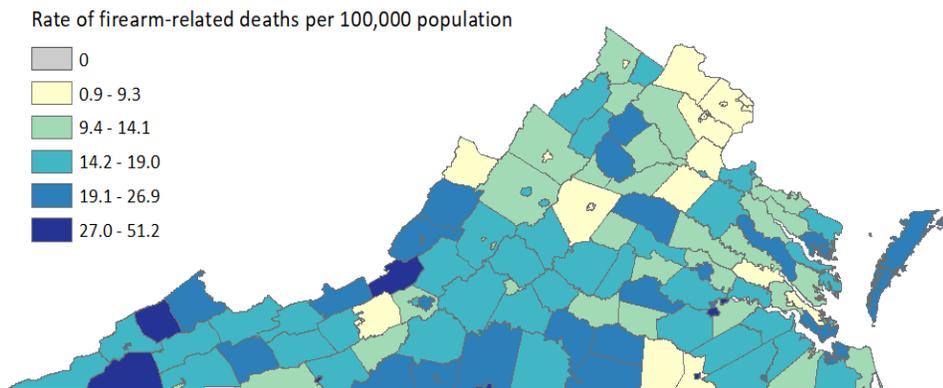
The city of Petersburg had the highest combined rate of firearm-related death during 2016-2021 (51.2). This was followed by Danville City (34.9), Craig County (32.7), Dickenson County (30.0), and Emporia City (28.5). The lowest rates during this period were Manassas Park City (0.0), Radford City (0.9), Arlington County (3.1), Falls Church City (3.4), and Lexington City (4.6).

A majority of firearm-related deaths in 2016-2021 were suicide deaths (62%), followed by homicide deaths (35%) (Figure 17). Firearm-related suicide deaths remained stable from 2016 to 2019, and increased 7% from 2019 to 2021 (662 in 2019 to 707 in 2021). Similarly, firearm-related homicide deaths remained stable from 2016 to 2019.

**Figure 17. Percent of firearm-related deaths by intent among Virginia residents, 2016-2021**



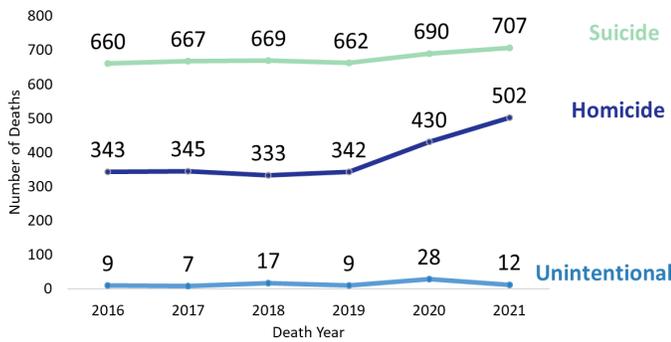
**Figure 16. Firearm-related death rates per 100,000 Virginia residents by locality, 2016-2021**



## Deaths (continued)

However, there was a notable 47% increase in firearm-related homicide deaths from 2019 to 2021 (342 in 2019 to 502 in 2021). Unintentional firearm-related deaths represented 1% of all firearm-related deaths; the highest number of unintentional deaths during 2016-2021 occurred in 2020 (28) and declined by over half (12) in 2021. Legal intervention or war and undetermined intent made up 2% of firearm-related deaths in 2016-2021 and are not shown in the figure (Figure 18).

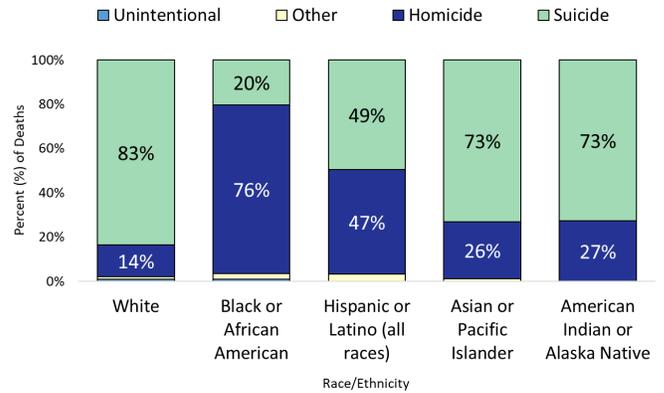
**Figure 18. Firearm-related deaths by intent and death year among Virginia residents, 2016-2021**



There were also differences in firearm-related deaths by race/ethnicity and intent (Figure 19). In 2016-2021, 83% of firearm-related deaths among White Virginians were by suicide; whereas, a majority of firearm-related deaths among Black or African American Virginians were by homicide (76%). Firearm-related deaths for Hispanic or Latino Virginians were split almost evenly at 49% for suicide and 48% for homicide. A majority of firearm-related deaths for Asian or Pacific Islander and American Indian or Alaska Native Virginians were by suicide. Unintentional firearm-related deaths ranged between 0%-1% for each racial or ethnic group.

Undetermined and legal intervention or war are combined as 'Other' due to low counts and to be more visible on Figure 19.

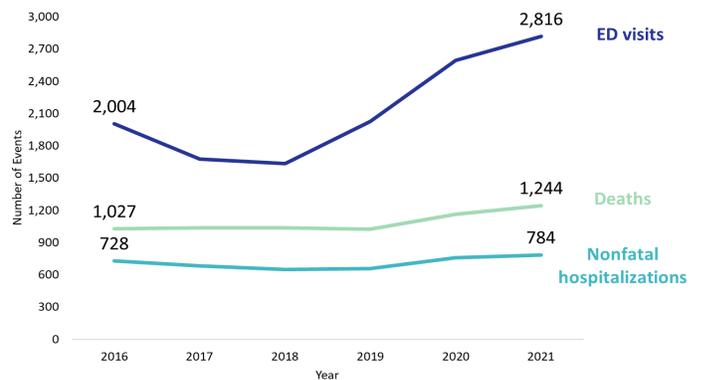
**Figure 19. Percent of firearm-related deaths by race/ethnicity and intent among Virginia residents, 2016-2021**



## Overall Trends in Firearm Injury

When looking at firearm injury trends for ED visits, nonfatal hospitalizations, and deaths, some trends emerge. The burden of firearm injuries and deaths has increased for all measures (ED visits, nonfatal hospitalizations, and deaths) in the past three years, with the most marked increase occurring in ED visits (Figure 20).

**Figure 20. Firearm injury ED visits, nonfatal hospitalizations, and deaths by year in Virginia, 2016-2021**



### Overall Trends in Firearm Injury (continued)

- Males consistently experienced the highest burden of ED visits (86%), nonfatal firearm related hospitalizations (87%), and firearm-related deaths (85%). Youth and young adults aged 15-24 years had the highest number and percentage of firearm injury ED visits, nonfatal hospitalizations, and deaths.
- A majority of firearm injury ED visits and nonfatal hospitalizations were among Black or African American Virginians, while the majority of firearm-related deaths were among White Virginians.
- Firearm injury ED visits and nonfatal hospitalizations had higher rates in more urban localities; deaths had higher rates in more rural localities.
- Among 133 Virginia localities, Petersburg City had the highest rate of firearm injury ED visits, nonfatal hospitalization, and death during 2016-2021.

Although the data in this report cannot answer the question of why firearm injuries continue to occur, previous research has identified a range of factors that may contribute to this issue of public health importance. Factors include social and economic stressors,<sup>12-14</sup> mental health challenges,<sup>5,6</sup> easy access to firearms,<sup>7,8</sup> alcohol and substance use,<sup>2-4</sup> high-conflict or violent relationships,<sup>10,11</sup> social isolation,<sup>33</sup> systemic racism,<sup>34-38</sup> and community-level economic inequality, unemployment, and poverty.<sup>15,16</sup> Addressing these risk factors and systemic inequities together as a team—including state and local governments, healthcare and service providers, community partners, neighbors, and friends and family—can reduce and prevent firearm injuries in Virginia.

### Resources and Trainings:

VDH is focusing efforts on firearm injury prevention through training and resources, technical assistance, and policy development.

**988 Suicide and Crisis Lifeline:** Free and confidential 24/7, call, text, or chat line available for people who are in distress and seeking help or their loved ones, and for healthcare professionals looking for best practices for suicide prevention. Multiple languages available.

**Reducing Access to Lethal Means: [Lock and Talk](#):** This project promotes safe and responsible storage of firearms and other forms of lethal means through trainings and the distribution of free cable/trigger locks for firearms.

**Trainings:** Learn more information about [suicide prevention trainings](#).

**Collaborations: [Gun Injury and Violence Advisory Board And Collaborative Network \(GIVEBACK\)](#):** Multi-sector workgroup facilitated by VDH and includes members from state agencies, community organizations, health systems, educational sectors, faith-based communities, and the general public who were directly impacted by or work with people who were impacted by firearm injury. GIVEBACK members advise VDH on development and dissemination of firearm injury data products. **Suicide Prevention Interagency Advisory Group (SPIAG):** Interagency workgroup, with the Virginia Department of Behavioral Health and Developmental Services and other state and local organizations, that works to develop suicide prevention policy and primary prevention efforts through the *Suicide Prevention Across the Lifespan Plan for the Commonwealth of Virginia*.

### Data Definitions, Methods, and Limitations

**ED visits:** Emergency department (ED) visit data were reported to the Office of Epidemiology by hospital-based and freestanding EDs in Virginia. ED visits related to firearm injury were identified using terms in either the chief complaint (reason for visit) or discharge diagnosis or by ICD-10 diagnosis codes that indicate an initial firearm injury visit (see [Firearm Injury Surveillance website](#)). Visits include Virginia residents and out-of-state residents seen at Virginia facilities. VDH assigns city/county using the patient's residential zip code. ED visit counts and rates are combined for certain [cities and counties](#) due to some zip codes spanning more than one locality. ED visit rates provide a consistent calculation to compare demographic groups or geographic areas. However, data quality has improved over time, which may impact trends over time. During the COVID-19 pandemic, a decrease in the total number of ED visits occurred in Virginia. Because of this change in health care seeking behavior, VDH urges caution when using rates per 10,000 ED visits during 2020. Read more about [syndromic surveillance data](#), including its limitations. VDH reports ED visits in combined race/ethnicity categories: Latino includes individuals of any race who identify as "Hispanic or Latino", all other categories are non-Hispanic persons; Asian or Pacific Islander includes persons who identify as "Asian" or "Native Hawaiian or Pacific Islander"; "Other race" includes persons who report "Other Race" or "Middle Eastern or North African".

**Nonfatal hospitalizations:** Data are from Virginia Health Information and maintained by the Virginia Department of Health (VDH). Nonfatal firearm injury hospitalizations are Virginia resident hospitalizations within Virginia and did not have a fatal status at time of discharge. Virginia resident cases hospitalized outside of Virginia would be excluded. Locality (city/county) is based on the residence of the patient at the time of hospitalization, not the hospital location. City/county is based on the zip code of the patient's residence at time of hospitalization. Some Virginia zip codes may cross city/county boundaries. This may cause under- or over-reporting of hospitalizations at the city/county level for those localities with zip codes that cross boundaries. Data are reported to VDH and analyzed by the Office of Family Health Services, Division of Population Health Data. Data are produced and processed from sources believed to be reliable and accurate at that point of time. Nonfatal firearm injury hospitalizations were identified using the firearm injury indicator definition from the [Council of State and Territorial Epidemiologists ICD-10-CM Injury Surveillance Toolkit](#). Hospitalization data were last updated and analyzed in September 2022.

**Deaths:** Firearm-related deaths are death certificate data maintained by VDH and certified by the National Center for Health Statistics. Data are of Virginia residents only, whether or not they died in Virginia. City/county is based on the residence of the patient at the time of death, not where the death occurred. Firearm-related deaths were identified using the firearm-related death definition from the [Centers for Disease Control and Prevention State Injury Indicators Report](#). Death data were last updated and analyzed in September 2022.

**Proposed Citation:** Virginia Department of Health. *Firearm Injuries in Virginia, 2016-2021*. Richmond, VA; 2023: 1-12.

**Acknowledgments:** VDH would like to thank GIVEBACK members for their insight, recommendations, and review of this data brief; Marilyn Metzler with CDC for health equity review; and the CDC FASTER team for their guidance and support. This work was supported by [CDC Firearm Injury Surveillance Through Emergency Rooms \(FASTER\) CDC-RFA-CE20-2005](#).

## Citations

1. Centers for Disease Control and Prevention. Fast Facts: Firearm Violence Prevention. May 4, 2022. Accessed November 9, 2022. <https://www.cdc.gov/violenceprevention/firearms/fastfact.html>
2. Hohl BC, Wiley S, Wiebe DJ, Culyba AJ, Drake R, Branas CC. Association of Drug and Alcohol Use With Adolescent Firearm Homicide at Individual, Family, and Neighborhood Levels. *JAMA Intern Med.* 2017;177(3):317-324. doi:10.1001/jamainternmed.2016.8180
3. Branas CC, Han S, Wiebe DJ. Alcohol Use and Firearm Violence. *Epidemiol Rev.* 2016;38(1):32-45. doi:10.1093/epirev/mxv010
4. Wintemute GJ. Alcohol misuse, firearm violence perpetration, and public policy in the United States. *Prev Med.* 2015;79:15-21. doi:10.1016/j.ypmed.2015.04.015
5. Sheats KJ, Wilson RF, Lyons BH, Jack SPD, Betz CJ, Fowler KA. Surveillance for Violent Deaths - National Violent Death Reporting System, 39 States, the District of Columbia, and Puerto Rico, 2018. *MMWR Surveill Summ.* 2022;71(3):1-44. Published 2022 Jan 28. doi:10.15585/mmwr.ss7103a1
6. Sarai SK, Abaid B, Lippmann S. Guns and Suicide: Are They Related?. *Prim Care Companion CNS Disord.* 2017;19(6):17br02116. Published 2017 Dec 21. doi:10.4088/PCC.17br02116
7. Harvard T.H. Chan School of Public Health. Means Matter: Firearm Access is a Risk Factor for Suicide. Accessed November 9, 2022. <https://www.hsph.harvard.edu/means-matter/means-matter/risk/>
8. Anglemeyer A, Horvath T, Rutherford G. The accessibility of firearms and risk for suicide and homicide victimization among household members: a systematic review and meta-analysis [published correction appears in *Ann Intern Med.* 2014 May 6;160(9):658-9]. *Ann Intern Med.* 2014;160(2):101-110. doi:10.7326/M13-1301
9. Jetelina KK, Reingle Gonzalez JM, Cuccaro PM, et al. Mechanisms and Frequency of Violent Injuries Among Victims and Perpetrators of Bullying. *J Adolesc Health.* 2019;64(5):664-670. doi:10.1016/j.jadohealth.2018.10.295
10. Kafka JM, Moracco KBE, Taheri C, et al. Intimate partner violence victimization and perpetration as precursors to suicide. *SSM Popul Health.* 2022;18:101079. Published 2022 Mar 25. doi:10.1016/j.ssmph.2022.101079
11. Adhia A, Kernic MA, Hemenway D, Vavilala MS, Rivara FP. Intimate Partner Homicide of Adolescents. *JAMA Pediatr.* 2019;173(6):571-577. doi:10.1001/jamapediatrics.2019.0621
12. Kim D. Social determinants of health in relation to firearm-related homicides in the United States: A nationwide multilevel cross-sectional study. *PLoS Med.* 2019;16(12):e1002978. Published 2019 Dec 17. doi:10.1371/journal.pmed.1002978
13. Barrett JT, Lee LK, Monuteaux MC, Farrell CA, Hoffmann JA, Fleegler EW. Association of County-Level Poverty and Inequities With Firearm-Related Mortality in US Youth. *JAMA Pediatr.* 2022;176(2):e214822. doi:10.1001/jamapediatrics.2021.4822
14. Schleimer JP, Buggs SA, McCort CD, et al. Neighborhood Racial and Economic Segregation and Disparities in Violence During the COVID-19 Pandemic. *Am J Public Health.* 2022;112(1):144-153. doi:10.2105/AJPH.2021.306540
15. Jacoby SF, Dong B, Beard JH, Wiebe DJ, Morrison CN. The enduring impact of historical and structural racism on urban violence in Philadelphia. *Soc Sci Med.* 2018;199:87-95. doi:10.1016/j.socscimed.2017.05.038
16. Chetty R, Hendren N, Jones MR, Porter SR. Race and Economic Opportunity in the United States: An Intergenerational Perspective. 2020; 711-783. doi: 10.1093/qje/qjz042
17. Sun S, Cao W, Ge Y, Siegel M, Wellenius GA. Analysis of Firearm Violence During the COVID-19 Pandemic in the US. *JAMA Netw Open.* 2022;5(4):e229393. Published 2022 Apr 1. doi:10.1001/jamanetworkopen.2022.9393
18. Collings AT, Farazi M, Van Arendonk KJ, et al. The COVID-19 pandemic and associated rise in pediatric firearm injuries: A multi-institutional study. *J Pediatr Surg.* 2022;57(7):1370-1376. doi:10.1016/j.jpedsurg.2022.03.034
19. Donnelly MR, Grigorian A, Inaba K, et al. A Dual Pandemic: The Influence of Coronavirus Disease 2019 on Trends and Types of Firearm Violence in California, Ohio, and the United States. *J Surg Res.* 2021;263:24-33. doi:10.1016/j.jss.2021.01.018

## Citations (continued)

20. Whitehill JM, Webster DW, Frattaroli S, Parker EM. Interrupting violence: how the CeaseFire Program prevents imminent gun violence through conflict mediation. *J Urban Health*. 2014;91(1):84-95. doi:10.1007/s11524-013-9796-9
21. Pardini D, Beardslee J, Docherty M, Schubert C, Mulvey E. Risk and Protective Factors for Gun Violence in Male Juvenile Offenders. *J Clin Child Adolesc Psychol*. 2021;50(3):337-352. doi:10.1080/15374416.2020.1823848
22. Steiner RJ, Sheremenko G, Lesesne C, Dittus PJ, Sieving RE, Ethier KA. Adolescent Connectedness and Adult Health Outcomes. *Pediatrics*. 2019;144(1):e20183766. doi:10.1542/peds.2018-3766
23. United States Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of Disease Prevention and Health Promotion. Injury and Violence Prevention Workgroup - Healthy People 2030. Accessed November 9, 2022. <https://health.gov/healthypeople/about/workgroups/injury-and-violence-prevention-workgroup/>
24. Mohatt NV, Kreisel CJ, Hoffberg AS, Mph LW, Beehler SJ. A Systematic Review of Factors Impacting Suicide Risk Among Rural Adults in the United States. *J Rural Health*. 2021;37(3):565-575. doi:10.1111/jrh.12532
25. Rowhani-Rahbar A, Simonetti JA, Rivara FP. Effectiveness of Interventions to Promote Safe Firearm Storage. *Epidemiol Rev*. 2016;38(1):111-124. doi:10.1093/epirev/mxv006
26. Grossman DC, Mueller BA, Riedy C, et al. Gun storage practices and risk of youth suicide and unintentional firearm injuries. *JAMA*. 2005;293(6):707-714. doi:10.1001/jama.293.6.707
27. Anestis MD, Bandel SL, Butterworth SE, Bond AE, Daruwala SE, Bryan CJ. Suicide risk and firearm ownership and storage behavior in a large military sample. *Psychiatry Res*. 2020;291:113277. doi:10.1016/j.psychres.2020.113277
28. Shepley M, Sachs N, Sadatsafavi H, Fournier C, Peditto K. The Impact of Green Space on Violent Crime in Urban Environments: An Evidence Synthesis. *Int J Environ Res Public Health*. 2019;16(24):5119. Published 2019 Dec 14. doi:10.3390/ijerph16245119
29. Kondo MC, South EC, Branas CC, Richmond TS, Wiebe DJ. The Association Between Urban Tree Cover and Gun Assault: A Case-Control and Case-Crossover Study. *Am J Epidemiol*. 2017;186(3):289-296. doi:10.1093/aje/kwx096
30. Rowhani-Rahbar A, Schleimer JP, Moe CA, Rivara FP, Hill HD. Income support policies and firearm violence prevention: A scoping review. *Prev Med*. 2022;165(Pt A):107133. doi:10.1016/j.ypmed.2022.107133
31. Rowhani-Rahbar A, Quistberg DA, Morgan ER, Hajat A, Rivara FP. Income inequality and firearm homicide in the US: a county-level cohort study. *Inj Prev*. 2019;25(Suppl 1):i25-i30. doi:10.1136/injuryprev-2018-043080
32. Kegler SR, Simon TR, Zwald ML, et al. Vital Signs: Changes in Firearm Homicide and Suicide Rates - United States, 2019-2020. *MMWR Morb Mortal Wkly Rep*. 2022;71(19):656-663. Published 2022 May 13. doi:10.15585/mmwr.mm7119e1
33. Motillon-Toudic C, Walter M, Séguin M, Carrier JD, Berrouguet S, Lemey C. Social isolation and suicide risk: Literature review and perspectives. *Eur Psychiatry*. 2022;65(1):e65. Published 2022 Oct 11. doi:10.1192/j.eurpsy.2022.2320
34. Houghton A, Jackson-Weaver O, Toraih E, et al. Firearm homicide mortality is influenced by structural racism in US metropolitan areas. *J Trauma Acute Care Surg*. 2021;91(1):64-71. doi:10.1097/TA.0000000000003167
35. Wong B, Bernstein S, Jay J, Siegel M. Differences in Racial Disparities in Firearm Homicide across Cities: The Role of Racial Residential Segregation and Gaps in Structural Disadvantage. *J Natl Med Assoc*. 2020;112(5):518-530. doi:10.1016/j.jnma.2020.05.014
36. Rudes G, Fantuzzi C. The Association Between Racism and Suicidality Among Young Minority Groups: A Systematic Review. *J Transcult Nurs*. 2022;33(2):228-238. doi:10.1177/10436596211046983
37. Oh H, Stickley A, Koyanagi A, Yau R, DeVlyder JE. Discrimination and suicidality among racial and ethnic minorities in the United States. *J Affect Disord*. 2019;245:517-523. doi:10.1016/j.jad.2018.11.059
38. Schleimer JP, Buggs SA, McCort CD, et al. Neighborhood Racial and Economic Segregation and Disparities in Violence During the COVID-19 Pandemic. *Am J Public Health*. 2022;112(1):144-153. doi:10.2105/AJPH.2021.306540

**FOR MORE INFORMATION:  
POPULATION.HEALTH@VDH.VIRGINIA.GOV  
MARCH 2023**